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Subject issues discussed at meeting

Hi, last night we discussed several items pertaining to the Gladstone treatment plant study;

1. The contractor is going to cost disposal costs for pumping sludge into Lake Emma; if this is found to be feasible the next step would be to consider cost effectiveness of high density plant versus low density more primitive type facility. By my calculations if one were to stockpile HDS for 6 months (winter) and pump only for 6 months we would need a ¼ million gallon tank (50' dia. X 18'). We're hoping that if pumping is feasible the contractor will make the comparison of what type of plant to build i.e. high or low density.
2. Bob Owen has done some calculations (based on our earlier regression analysis model) on what to expect at CC48 and A72 given the existing plant scenarios at Gladstone (attached). He is currently working up some new information as well. Katy's and Briant's responses to the same question (what to expect for reductions at CC48) were considered. We thought the next step is to use a combination of new water quality data for recent years and recent mine discharge date (expected reductions from a new plant) and plug that information into the Otis model Katy used in 1996. Let's see what the results and weaknesses are before we consider whether a new tracer would be beneficial.
3. A daytime meeting to discuss these issues would be useful sometime in the future but we should wait until Bob is finished with his analysis and we're hoping that Katy can redo OTIS using recent inputs. Also we should have the contractor's new work concluded (pumping, plant comparisons). Having these tasks concluded would make our time most effective.
4. We want to continue optimizing this TBA report because it will be most useful when seeking funding. It could also help our efforts secure a good Samaritan pilot provision through Congress. Our proposal includes an appropriation that could be used for plant construction, O & M, of course if passed and appropriated.

So that's it for a quick recap, hopefully the TBA will continue to fund some of this needed work.



Thanks for all the help thus far Sabrina. Bill Treatment red.doc 11-13-06 memo.doc

Estimated Effect of Implementing Gladstone Treatment Plant Plan on Zinc Concentrations at CC48 and A72

Background

A "conservative" mass balance water quality model was developed for the upper Animas Use Attainability Analysis to estimate the effects of various sources of metal loading on metal concentrations at the four gages. I updated the water quality model using flow-concentration equations at A68, A72 and M34 gages with data for 2003-2005 water years. The equation for CC48 used data from January 2004 to November 2005. Treatment of Cement Creek ended in late 2003 and the flow concentration relationship appeared more stable beginning in 2004. The updated equations account for improvements in water quality in Mineral Creek owing projects at the Kohler tunnel and elsewhere in the basin. The equation for Cement Creek reflects the higher levels of zinc per unit of flow that have been observed at CC48 since 1999. Equations at A68 and A72 were similarly updated.

I used the model to test the potential effects of a treatment plant at Gladstone on zinc concentrations at CC48 and A72 if the plan to treat the three adits was implemented. I imposed two constraints on the model:

1. Load reduction does not exceed 150 pounds per day, the plant capacity
2. There is consensus that a significant amount of zinc enters Cement Creek below South Cement Creek. Zinc concentration at CC48 was not allowed to go below 600 ug/l. 600 ug/l approximates the lowest concentrations observed at CC48 immediately following implementation of the Consent Decree.

Results

Zinc concentrations at CC48 and A72 are shown in Tables 1 and 2 for two flow scenarios. The first scenario compares the before and after dissolved zinc concentrations at CC48 and A72 using the 15th percentile low flows that the WQS and TMDL's are based upon. The water quality standards at A 72 are also presented. The second scenario compares before and after treatment concentrations at median or 50th percentile monthly flows. I ran the second scenario, because it became apparent that during low flow years there may not be 79/150 pounds per day of zinc to treat.

Discussion

As I worked through the two scenarios several things became apparent. Through much of the year there may not be enough zinc to remove as anticipated by the plan, which could have a positive effect on operating costs. Moreover, during low flow years my assumption that the zinc level in Cement Creek was not allowed to go below 600 ug/l

may not be realistic. This assumption implies that the only "natural" decrease in zinc is from the three adits. I think it's a safe guess, but not entirely realistic. Therefore the zinc concentration at CC48 and A72 under the low flow scenario may be overestimated. This could be an argument for getting a better handle on the amount of zinc entering Cement Creek between South Cement and CC48 under a wider range of flow conditions.

The model shows that treating the three adits goes a long ways towards meeting the water quality standards for zinc at A72 taken together with improvements already made in the upper Basin. I hope the model can be used to challenge our assumptions and direct our activities so that projects can be selected that will meet the water quality goals for the basin.

Table 1. Estimated zinc concentration at 15th percentile low flow

Month	Flow A72	Load Reduction	Concentration in ug/l				
	cfs	lbs/day	Old CC48	New CC48	Old A72	New A72	WQS A72
January	46	-47	1353	600	731	542	460
February	47	-57	1507	600	832	606	520
March	59	-76	1683	600	946	709	620
April	86	-68	1577	600	968	820	570
May	285	-114	1141	600	640	566	430
June	676	-71	745	600	333	313	250
July	215	-71	1043	600	367	306	170
August	120	-102	1681	600	478	322	240
September	114	-150	2279	612	577	335	290
October	82	-122	2414	600	733	457	340
November	72	-111	2032	600	741	456	380
December	56	-65	1552	600	717	503	420

Table 2. Estimated zinc concentration at 50th percentile flow

Month	Flow A72	Load Reduction	Concentration in ug/l				
	cfs	lbs/day	Old CC48	New CC48	Old A72	New A72	WQS A72
January	68	-56	1348	600	645	491	460
February	62	-65	1504	600	772	577	520
March	68	-81	1681	600	915	693	620
April	126	-94	1566	600	875	735	570
May	596	-150	1057	707	525	479	430
June	1060	-39	651	600	291	284	250
July	487	-129	967	600	222	173	170
August	201	-150	1658	664	358	220	240
September	159	-150	2266	1027	499	324	290
October	115	-150	2404	745	649	408	340
November	84	-121	2029	600	704	438	380
December	69	-72	1548	600	669	476	420

MEMORANDUM

TO: Sabrina Forrest
FROM: Jerry Goedert
DATE: November 13, 2006
SUBJECT: Gladstone TBA

Based on Bill Simon's October 27, 2006 e-mail, UOS will prepare a conceptual design for pumping sludge from the Success Placer to Lake Emma. The conceptual design will include pipeline routing alternatives, pipeline specifications, cost, and a discussion of operational considerations. ARSG will evaluate the conceptual design and determine whether an evaluation of a semi-passive water treatment system is warranted. I propose that this work be inserted into the draft Water Treatment Evaluation Report as a stand-alone addendum. This would eliminate the effort required to rewrite the existing report to incorporate the mine pool sludge disposal alternative.

UOS conducted a limited (Upper Cement Creek, American Tunnel, Upper Gold King 7th Level, Red & Bonita, and Mogul) sampling event in early October. A couple of observations on the flow rates observed in October 1996: the Upper Cement Creek flow rate was 2.5 times the flow rate in 2005 (it has been a wet late summer there); and the Upper Gold King 7th Level flow rate was 314 gallons per minute (gpm) versus 135 gpm in September 2005 and 42 gpm in July 2005.

The analytical data from this sampling event has been received from the laboratory and sent to Tech Law for validation. When the validation report is available, a trip report will be prepared. The preliminary results indicate that the Upper Gold King 7th Level metal concentrations were lower in October 2006 than in September 2005, but due to the higher flow rates, the metal loading from the Upper Gold King 7th Level were considerably higher (50-100 %) in October 2006 than in September 2005.

cc: File/ UOS